and labor. The allowances given in Table V can be safely used when the bushings are made somewhere near the proportions indicated in Tables *I* to IV, but for extra long bushings more liberal allowances should be made.

Before hardening, the bushings should be plainly stamped with the size and purpose for which they are intended, "|f drill/' "| ream/[3] etc. They should be stamped with a set of plain sharp figures, reserved solely for this purpose. It is poor practice to try to stamp the words "drill," "ream," etc., in a straight line, as this is difficult to do. If, however, the words are laid out on a slight curve the results are more satisfactory, as slight irregularities of alignment are not then so noticeable. Sharp clean figures and letters, neatly laid out, not only improve the appearance of the toolmaker's work, but also save the drilling operator's time, as sharp clean-cut figures can be read at a glance.

Hardening Jig Bushings. — When hardening bushings made of tool steel they should be brought to an even red heat in a clean fire; the heating should never be hurried. When bushings are heated quickly, they are apt to heat unevenly, which results in warping or distortion that makes it impossible to finish them to the required size. Gas furnaces are excellent for heating, but a clean charcoal fire will answer the purpose. As soon as the bushing has been brought to an even red heat, it should be dipped in water just warm enough to take off the chill. The bushing should then be heated to a "sizzling" heat, after which it is left in the air to cool. Some toolmakers draw bushings to a medium straw color. This is a mistake as it only tends to shorten their life.

Grinding and Lapping. — There are four methods in common use for finishing holes in jig bushings: i. Lapping with a lead lap. 2. Lapping with a lead lap followed by a cast-iron or copper lap. 3. Internal grinding. 4. Internal grinding followed by a cast-iron or copper lap for removing the last 0.0005 inch. The first method is erroneous, as it invariably results in bell-mouthed holes, especially when the toolmaker charges the lap while in use, which is an unsatisfactory but very common